Space Weather Forecast

Issued on Sunday, 14 August 2022 at 12:24 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Minor Geomagnetic Storm on day 4 (17th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with occasional Common-class flares. There are currently eight sunspot regions on the visible disc, with largest and most complex developing in the northwest quadrant over the past 24 hours. There are a couple other noteworthy regions in the southwest and northeast, which were responsible for the two largest flares in the period. All other regions on the disc are relatively small and simple. However, one in the southeast was the source for a small Coronal Mass Ejection (CME) around 13/1700 UTC. This has been analysed and is forecast to primarily pass south of Earth on the 17th. No other Earth-directed CMEs were observed in the available imagery.

Solar Wind / Geomagnetic Activity: The solar wind is showing a waning fast wind environment, with speeds declining from around 530km/s to 480km/s. The total magnetic field was weak throughout with only weak variations in the important north-south component. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to remain predominantly Low, but with a chance of increasing to Moderate.

Solar Wind / Geomagnetic Activity: Earth is currently seeing the decline of the fast wind from a coronal hole. The next coronal hole fast wind is due to arrive on day 4 (17th), with speeds of 500-600km/s likely. However there is the chance that this enhancement may be further enhanced by a glancing blow from a CME which left the Sun on the 13th. Geomagnetic activity is expected to be mainly Quiet, with isolated Unsettled intervals through the next three days. On day 4 (17th), activity is expected to become Unsettled to Active, with a chance a Minor Storm and slight chance of a Moderate Storm.

Energetic Particles / Solar Radiation: Solar radiation storms are unlikely, but there is a slight chance of an S1 or greater event due to the three more complex regions on the disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	30
Strong	G3	No	1	1	1	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	3	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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